LB 1596
U6 O5

VOLUME XVI NUMBER 30

The Ohio State University Bulletin

MANUAL TRAINING FOR THE GRADES

COLLEGE OF EDUCATION

April, 1912

PUBLISHED BY THE UNIVERSITY AT COLUMBUS

Entered as second-class matter November 17, 1905, at the postoffice at Columbus, Ohio, under Act of Congress, July 16, 1894.

Monograph

U. OF I.
JUN 1 1912

LB1596
.W6U5

THE OHIO STATE UNIVERSITY

ORGANIZATION

The Ohio State University, located at Columbus, forms a part of the public educational system maintained by the State. It comprises seven colleges and a graduate school:

The College of Agriculture.
The College of Arts, Philosophy and Science.
The College of Education.
The College of Engineering.
The College of Law.
The College of Pharmacy.
The College of Veterinary Medicine.
The Graduate School.

The University publishes bulletins describing the work of each of these colleges. Copies may be obtained by addressing W. E. Mann, University Editor, Columbus, Ohio. Persons desiring information are invited to send for the bulletin of that college in which they are interested.

COLLEGE OF EDUCATION

This College is one of the instrumentalities of the State for the training of teachers. It offers practical and theoretical courses for the professional training of high school teachers and principals, of principals of elementary schools, of supervisors of special studies, of superintendents of school systems, and of instructors in normal schools. Its purpose is to assist the student in the acquirement of a knowledge of the branches which he wishes to teach, to give him a right attitude toward education, and to establish in him a skill in the use of efficient methods of teaching.

The demand for trained teachers has increased rapidly. The College has been in existence for five years, and has graduated four classes. All its graduates were appointed to positions as soon as they were ready for them. The call for teachers in certain lines, viz., science, mathematics, and manual training, has been greater than the college could supply. It is earnestly hoped that many students may see the opportunity open in these fields and prepare for the work.

The effort of the college is to bring into proper adjustment within the limits of a four-year course the academic training, the theoretical professional training, and the practical professional training necessary for a teacher.

FACULTY AND INSTRUCTORS

WILLIAM OXLEY THOMPSON, D. D., LL. D., President of the University.

WILLIAM W. BOYD, Ph. D., DEAN, Professor of School Administration.

WILLIAM FRANKLIN GEPHART, Ph. D., Secretary, Professor of Economics and Sociology.

ANNA F. BLOHM, B. Sc., Assistant Professor of Domestic Art.

ROSSER DANIEL BOHANNAN, B. S., C. E., E. M., Professor of Mathematics.

ALFRED DODGE COLE, M. A., Professor of Physics.

JOSEPH VILLIERS DENNEY, M. A., Professor of English.

SAMUEL CARROL DERBY, A. M., Professor of the Latin Language and Literature.

M. BLAKEMORE EVANS, Ph. D., Professor of German.

FRANK P. GRAVES, Ph. D., LL. D., Professor of the History and Philosophy of Education.

JAMES E. HAGERTY, Ph. D., Professor of Economics and Sociology.

THOMAS MCDOUGAL HILLS, Ph. B., Assistant Professor of Geology.

GEORGE WELLS KNIGHT, Ph. D., Professor of American History.

MARY R. LAVER, Professor of Art.

THOMAS KENYON LEWIS, B. Sc., Assistant Professor of Manual Training.

THOMAS SCOTT LOWDEN, Ph. D., Associate Professor of the Principles and Practise of Education.

WILLIAM MCPHERSON, Ph. D., Professor of Chemistry.

DAVID R. MAJOR, Ph. D., Professor of Psychology.

WILBUR HENRY SIEBERT, A. M., Professor of European History.

HENRY RUSSELL SPENCER, Ph. D., Professor of Political Science.

KARL DALE SWARTZEL, M. Sc., Professor of Mathematics.

RUTH AIMEE WARDALL, M. A., Professor of Domestic Science.

EDNA NOBLE WHITE, B. A., Associate Professor of Domestic Science

OLIVE JONES, B. A., Librarian.

H. SHINDLE WINGERT, M. D., Professor of Physical Education.

GEORGE L. CONVERSE, Captain U. S. A., Professor of Military Science and Tactics.

ALICE LITTLEJOHN, M. D., Associate Professor of Physical Education for Women.

MANUAL TRAINING.

The College of Education offers a course in Manual Training which leads to the degree of Bachelor of Science in Education. This course affords a broad educational foundation with enough technical work to prepare teachers for efficient service. It is possible to elect one's work so as to receive three years' instruction in wood, metal or occupational courses.

The course of study is based on:

1. Academic Training.
2. Theory, Practise and Methods of Teaching Manual Training.
3. Principles and Practise in Elementary and Technical Applied Design
4. Complete Technical Training in the Laboratories.
5. Graphic Methods by the study of Freehand Mechanical Drawing and Lettering.
6. Principles of Psychology and Education.
7. Design of Problems in each Laboratory Course.

The part that these pedagogical tools have in forming a practical course in manual training is indicated in the following outline:

COURSE IN MANUAL TRAINING

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
English (101)	2.	English (104)	2.
French or German	4.	French or German	4.
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Mathematics (121)	3.	Mathematics (122)	3.
Drawing (101)	2.	Drawing (102)	3.
Art (103)	2.	Art (104)	2.
Military Drill	1.	Military Drill	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

English (131)	3.	English (132)	3.
French or German First year language continued.	4.	French or German First year language continued.	4.
Psychology (101)	3.	Psychology (102)	3.
Art (101)	2.	Art (102)	2.
Shopwork (109) Woodworking.	2.	Shopwork (114) Cabinetmaking	2.
Drawing (103)	2.	Shopwork (116) (Forging.)	or
		Handwork for Supervisors	2.
Military Drill	1.	Military Drill	1.

THIRD YEAR

Physics (103)	4.	Physics (104)	4.
Sociology (101)	3.	Sociology (102)	3.
Psychology (107)	2.	Psychology (108)	2.
Constructive Design	3.	Clay Modeling	3.

Either Group A or Group B must be elected.

GROUP A

Shopwork (105) Foundry.	2.	Shopwork (118) Advanced Forging.	2.
Shopwork (119) (Elementary machines.)	or	Shopwork (122) (Advanced machines.)	or
Wood-Turning and Pattern Making (129)	3.	Wood-Turning and Pattern Making (130)	3

GROUP B

Sheet Metal Work	2.	Sheet Metal Work	2.
Pottery	3.	Pottery	3.

FOURTH YEAR

History of Education (101)	3.	History of Education (102)	3.
Principles and Prac. (101)	3.	Principles and Prac. (102)	3.
Teaching of Manual Training	3.	Materials, Methods, and Equipment	3.
Elective	3 to 5.	Elective	3 to 5.

Also Group A or Group B must be elected.

GROUP A

Shopwork (123) (Machine.)	or	Shopwork (126 or 128) (Machine.)	or
Shopwork (131) (Cabinet.)	3.	Shopwork (132) (Cabinet.)	3.

GROUP B

Textiles or Leather Work	3.	Textiles or Wood Carving	3.

The College of Education, desiring to assist teachers of all grades, issues this bulletin especially for the purpose of presenting the following course of study in manual training for the grades, which has been prepared by the head of the Department of Manual Training, Assistant Professor Thomas K. Lewis.

This course of study is arranged after a careful study of the work now being done in our leading schools, and it should prove sufficiently flexible to meet most of the usual requirements: variations in appropriations and local conditions. It is hoped that it will meet, to a great extent, the following requirements, when taken with a four-year high school course:

1. To furnish a broader and more appropriate foundation for higher technical education.

2. To serve as a developing school where pupils can discover their capacities and aptitudes, whether in the direction of literature, science, engineering or the practical arts.

3. To furnish those who look forward to industrial life, opportunity to become familiar with tools, materials, the methods of construction and technical drawing, as well as mathematics, elementary science and ordinary English branches.

4. To furnish a logical development of tool experiences and corresponding mental training that underlies the manipulation of any material, and from these experiences the teacher may determine and organize in systematic form such educational activities as are best suited to the development of the mind.

5. With the ability to execute in the right direction, comes the necessity of utilizing this ability in the construction of the beautiful as well as the useful, thus bringing forth the finished article in its highest perfection. Mere construction without the idea of beauty is depressing.

Manual Training, to be universally applicable, must be so regulated with regard to cost of equipment and maintenance that it may come within the reach of the district schools in our most remote sections; therefore the acquisition of over-equipped shops, high priced materials, and complex machines for the beginner should be discouraged.

In following out this course, the construction work of the first five grades may be taught by the grade teacher in her class-room, while the work of the upper grades necessitates a construction shop and a teacher with special training. All the work in the high school is done in specially fitted shops. The cost of equipment for bench wood-working may be estimated between $85.00 and $200.00 for a class of twelve. A minimum equipment for a class of eighteen in paper, clay, textiles, card board, wood (knife work), metal or leather can be purchased for $10.00. With the initial cost for installation at this low fignre, every district school teacher should be encouraged to begin at least one of these forms of manual work with the children.

The cost of maintenance per pupil a term is estimated as follows:—

Paper	10 cts.	Metal	25 cts.
Cardboard	20 "	Advanced Wood	60 "
Clay	5 "	" Textile	30 "
Elementary Textile	23 "	Pottery	25 "
" Wood	20 "	Leather	50 "

AN OUTLINE OF MANUAL TRAINING FOR THE GRADES

FIRST GRADE

PAPER FOLDING AND CUTTING

Cutting to line, free cutting, folding and cutting, measuring one inch.

Cutting from object, poses, animals in action, game, song and story. Border and centerpiece patterns for wall paper, tiles, etc., picture mount, sailboat, boxes, baskets, envelopes, sleds, pin wheels.

CLAY MODELING

Mass work—Training hand and eye to represent quickly the general shape of any object placed before the class. Three proportions. Simple detail work—Two proportions—Outlines. Type solids and their application to fruits and vegetables. Outlining leaves, flowers and conventional forms on tiles and panels.

TEXTILES

Three strand braid, braided mat and napkin ring. Alternation of woof and warp threads for purpose of binding. Simple straight line designing and color study in borders, band or one inch spaces of warp strands. Doll blankets, dish cloths, lamp mats, rugs and paper mats one inch strips.

MATERIALS

Eggshell, manila, and pulp drawing paper, bogus, bristol ,cotton floss, paste.

Second-washed potters clay or modeling composition.

Antique cover paper, cotton wick, carpet warp, yarn, raffia, chenille, carpet wool, silkolene.

TOOLS

Ruler graduated to 1 inch only. Pencil, tooth-picks, scissors, crayons, brush and punch.

Modeling tools made from meat skewers or tooth brush handles. Oil cloth, string, clay jar. Jute board, loom, scissors, rug needles No. 18.

APPLIED DESIGN

The design is based on the power gained from the work in drawing. Lay tablets, pegs, cuttings, leaves, flowers, in rows, and application of design for decorating constructive problems. Constructive drawing of the project, made directly upon the material used. This may be secured: (1)through illustrations by the teacher (imitation), (2) by dictation, (3) by copying a model, (4) by simple blackboard drawing, (5) by pupil planning independently to meet a given need.

SUGGESTIONS

Work out in any of the media through the help of specimens, games, pictures, songs, visits, etc., large charts or tableaux showing the various home activities and trade industries of the environment of pupil and school, such as washing day, ironing day, mending day, shopping day, sweeping day, baking day, carpenter, blacksmith, baker, shoemaker.

Furnish a doll house, which was made by an upper grade.

Representation of a farm yard, school yard, Indian village, dairy yard.

From large building blocks make houses, forts, churches, bridges.

Constructions based on holidays, for example: Puritan hat and cradle, fireplace and Christmas tree trimmings, valentines, hatchet and colonial hat.

SECOND GRADE

PAPER AND CARDBOARD

Free cutting, folding, folding and cutting to ½inch (adding, subtracting, multiplying), planning and making paper patterns, pasting, use of circle maker, geometrical and symmetrical cutting with their application, binding, tying, lacing.

Border and center piece patterns for wall paper, tiles, rugs, mats. Blotting pad, easel, recipe-book, circle maker, picture frame, boxes, baskets, lamp shades, Indian canoe, collection envelopes.

CLAY MODELING

Two proportion work, emphasizing essential details, outlining and building up. Tile and panel form work. Simple animal forms.

TEXTILES

A study of the possibilities of textile designing as brought out in work with paper mats.

Wrapping, braiding, weaving, lacing, knotting, curtain, dish cloth, paper mat ½ inch strips, rugs or bags. Wrapped raffia napkin ring, picture frame or broom holder, using cardboard forms. Three strand braid, basket, mat or doll hat. Reed mats.

MATERIALS

Eggshell paper, manila paper, tinted bristol, folding bristol, court tag board, flour paste, potter's clay.

Miner's wicking or knitting cotton, raffia, natural and assorted colors. Reed No. 2.

NEW TOOLS

Modeling tools (nut picks)

Ruler graduated to ½ inch, circle maker, crayons, punch, Japanese brush, rug needles, darning needles.

APPLIED DESIGN

Extension of the idea of design as used in the first grade.

Shape, repetition, spacing.

Free cutting of geometrical and symmetrical designs—to be used as stencils.

SUGGESTIONS

Representative work on shelter, dress and implements of different people at different periods—Settings which come up for consideration in the study of history, geography and English.

Eskimo huts, boats, sleds, spears, tree man, cave man, adobe houses.

Holiday constructions. Flags of the nations. Simple books for pupil's spelling lessons, shopping list, dictionary, envelopes.

Construct simple compass, clock dial.

Measures, geometrical surfaces, and solids in connection with number work.

THIRD GRADE

CARDBOARD

Measuring ¼ inch, binding with laps or floss, scoring, cutting with knife, pasting and gluing with brush, use of compass. Assembling, shaping, fitting, punching, knotting. Ability to use and make development drawings to ½ and ¼ size. Ratio work.

Wall pocket, candy boxes, button baskets, post card box, fan, tray. Construct house and furniture to scale, portico, art book, lantern, brush broom holder, church window, wind mill, mineral specimen box.

CLAY MODELING

High relief, through cutting away method.

Simple figure and statuary work.

Conventional and geometric designs, applicable to tiles and panels.

Illustrate poses, groups, animals at rest or in action, adobe houses.

TEXTILES

Development of weaving up to the wooden hand loom, shuttle and heddle stage.

Designing in stripes, plaids, checks and centers.

Four strand braid, and wrapped round baskets, reed baskets.

Use inventions of the loom to make a woolen rug, silk hand bag, or cotton curtain.

Basket with wooltwine filler.

Make a needle case, using reed filler.

MATERIALS

Folding bristol, tinted bristol, court tag board, LePage's glue, flour paste.

Colored raffia, silk knitting cotton, mercerized cotton, round reed Nos. 2 and 4, wool twine.

NEW TOOLS

Eagle compass, skew knife, 45° triangle, pulp desk board or desk top, water colors, slate or wooden board, cloth to moisten clay, sponge, shoe knife.

Simple hand loom, suitable to the school room, with shuttle, heddle and winding device.

APPLIED DESIGN

Use seeds pods, grasses, flowers, and fruit with suitable adaptations.

Use water colors to work out motives for clay constructions.

SUGGESTIONS

Farm wagon, sled and plow. Work out some of the things which Robinson Crusoe found necessary for his home.

Illustrate food processes, for example: grinding of meal by hand; butter; cheese; yeast making and drying fruit.

Ant house, soil box.

Use baskets for flowers and school garden products.

Holiday gifts. Representative groups in clay, such as: bird's nest, plate of fruit, Greek athletes, King Arthur's Tournament.

FOURTH GRADE

CARDBOARD

Evolution of geometric solids with their application to useful objects. Use measurements to ⅛ inch.

Elementary Book Binding, such as: assembling, sewing, gluing on super and cover, placing sheets, use of paste plate, pasting, lining and book covers, shaping, fitting and finishing. Repairing books.

TEXTILES

Raffia knotting, forming raffia baskets, five strand braid.

WOOD WORKING

Straight edge cut, cross grain cut, diagonal cut, convex cut, concave cut.

Whittling, sawing, planing edges with shooting-board, chip carving.

Properties of different woods and consideration of third dimension.

MATERIALS

Folding bristol, straw, cloth, pulp and jute boards, leatherette, cambric cover, lining, book and marble papers. Hemp cord, linen thread, onion skin paper, book binder's glue and linen.

Round reed Nos. 2 and 4. Raffia, natural and colored rug, needles.

⅛, ¼ and ⅜ inch bass wood or red cedar, sandpaper, glue, brads water stains.

NEW TOOLS

Whittling knife, back saw, brush, try square, coping saw, shooting board, carver's punch, block plane, brad awl, gimlets, hammer, desk top.

Sheet iron for paste plates and for replacing loose leaves, sewing frame, press, needles, cutter, sponge, mallet, punches, water colors, pen and ink.

APPLIED DESIGN

Development drawing made full size, ½ size or ¼ size. Make simple view drawings of problems in wood to show third dimension.

Terms used:—center line, full line, dash line, dimensioning line.

Study examples of the following principles as needed in carrying the necessary qualities of good design:—Order, balance, proportion, repetition, radiation, symmetry.

Geometric forms, natural forms, conventional forms.

SUGGESTIONS

Grain elevator, freight cars, and boats made in paper to illustrate work in geography—transportation.

Rain gauge, soil boxes, lighthouse.

Block house, relief maps in clay and sand, log house, sail boat, flail, braker, carder, cotton gin, loom, shuttle, and heddle as needed in the study of weaving.

Fulton's boat, catapult, dog house, stained glass windows, holiday gifts.

Make Hiawatha's bow, arrows, canoe, wigwam, and beaver dam, butter-fly net and mounting board.

FIFTH GRADE

TEXTILES

Raffia knotting, crochet stitch baskets, work bag, raffia pillow, reed mats, splint mats, raffia hats, cane chair seats, reed waste baskets, reed weaving.

LEATHER

Cutting, paring, gluing, embossing, tooling, staining, incising, carving, applique.

Note book, card case, napkin ring, pocket book, magazine cover, table mats, table covers, shopping bag, porch pillow covers, belts.

KNIFE WORK PERIOD—WOOD WORKING

Continuation of the principles brought out in the fourth grade, but involving larger constructions.

Laying out work, shaping, fitting, assembling, finishing, decorating, and care of tools.

Letter box, paper knife, easel, ring toss, fox and geese board, checker board, bird house, wind mill, kites, tip cat, bat, wagon, toy furniture, wheelbarrow.

MATERIALS

Reed Nos. 1, 2, 3, 4 and 6. Raffia, natural and colored.

Sheep skin, split cow hide, ooze calf skin, russia calf skin, stains, linen thread and silk.

Basswood, ⅛, ¼, ⅜ and ½ inch, and red cedar, pine, white wood, tissue paper, string, screws, water stains, wax polish.

NEW TOOLS

Darning needles, slate, 9 x 12 inches, punches, sewing needles, paring knife

Chip carving knife, veining chisel, desk top, oil stone.

SUGGESTIONS

Papier mache relief maps.

Make a large wood doll house for first grade, also child's size hammock. Wind mill with pump attached. Canal locks and boats.

Construct simple science apparatus as: levers, inclined plane, siphon, suction pump, pop gun, barometer, and pulleys.

Representation of the home of the Mound Builders, Cliff Dwellers, Indians, Philippino natives, Puritans, Kansas settlers.

SIXTH GRADE

TEXTILES

Domestic art for girls. Raffia knotting, fancy hats.

METAL WORK

Sheet metal, bending, hammering, forming, embossing, punching, cutting, chasing, soldering, sawing, etching and finishing.

Trays, sconce, lamp shades, lanterns, letter box, copper bowl, clasps, candle shade, clock case, blotter corners, spoons, platter, pen rack, easel. Bridge (bent iron) vase holder, picture frame.

WOOD WORKING

Shaping of thick, soft wood. Planing, sawing, squaring, boring, chamfering, nailing, box construction, carving, punching, veining, chipping, staining, polishing, shellacking.

Rule, trellis, sun stick, lever and fulcrum, swing board, teapot stand, bread board, whisk broom holder, scouring board, sleeve board, coat hanger, twine holder, shelves, egg rack, wind mill, flower stand, paper file, magazine rack, news stand.

MATERIALS

⅝ and ¼ inch white wood, ⅞ inch pine, ½ inch gum or bass wood, orange, shellac, linseed oil, nails, sandpaper, ground colors, vandyke brown, ochre, bone black.

Soft sheet copper, brass, tin, gauge, Nos. 21 to 24. 20, 10 and 6 penny nails, emery cloth, soldering materials, venetian bent iron, bronze binders, lacquer, raffia, needles, thread.

NEW TOOLS

Wood shop equipment—smoothing plane, carpenter's rule, rip and cross cut saws, brace and bit, turning saw, nail set, spoke shave, brushes, shellac cans.

Pitch block, mallet, blocks of soft and hard wood for anvils, snips, files, hack saw, pliers, soldering iron, hammers, pincers, rivet set, vise, sand bag, metal saw.

APPLIED DESIGN

Constructive design of problems in wood work.

Detail working drawings from blackboard, blue print, and objects. Scale work.

Two view assembly working drawings. Working sketches.

All problems to be designed by the individual student.

SUGGESTIONS

Use trellis, window box, etc., in connection with the school garden.

Study of the lumber industry and its tools. Model of a saw mill.

Lumber raft, water wheel, over-shot, under-shot, breast and sluices.

Colonial house, prairie schooner. Relief maps. Hygrometer.

Soldering and mending tinware.

Make simple untensils for the school kitchen. Specimen cases.

SEVENTH GRADE

WOOD WORKING

Working face, working edge, squaring ends, chamfering, using common joints in easy construction, end laps, gauging, squaring, sawing, planing, chiseling, finishing.

Picture frame, easel, book rack, foot stool, blotting-pad, hat rack, knife box, salt box, window box, doll cradle, bread board, bench hook, knife strap, sleeve board, box, tool rack, loom, coat and trouser hanger, card file.

MATERIALS

⅜ inch red cedar, red wood, sweet gum, poplar or chestnut, ½ and ⅞ inch pine, whitewood, ash or chestnut, screws, dowel-pins, shellac, wood filler, stains, polishing wax.

NEW TOOLS

Bench and equipment:—back saw, planes, marking gauge, chisels, screw driver, mallet, hammer, shooting board, wing dividers, counter sink, brace and bits, oil stone and strap.

APPLIED DESIGN

Constructive design of problem, decorations, design.

SUGGESTIONS

Sand tray, specimen box, physics apparatus, drawing board.

EIGHTH GRADE

WOOD WORKING

Elementary joinery, cabinet work, sharpening tools.

Ink stand, pin tray, card plate, tool handle, glove stretcher, turning saw frame, loom, canoe paddle, towel rack, plate rack, neck-tie rack, tabourette, table, sled, magazine rack, book case, stamp box, stationery box, waste basket, medicine cabinet.

MATERIALS

Pine, sweet gum, oak, ash, chestnut, mahogany. Screws, glue, stains, fillers, shellac, varnish, wax.

DESIGN

Original projects, requiring: planning, laying out, shaping, mortise and tenon, clamping, doweling, carving.

SUGGESTIONS

Chest, shoe box, letter box, lamp, hall seat, piano bench, physics apparatus, foot rest, pressing board, cane rack, umbrella rack, hall clock, shaving cabinet, writing desk, sewing table.

MAY 27 1912

The Ohio State University Bulletin is issued at least twenty times during the year; monthly in July, August, September and June, and bi-weekly in October, November, December, January, February, March, April, and May.

.U605

LIBRARY OF CONGRESS
0 019 744 373 A

Hellinger Corp.